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ABSTRACT

This paper proposes that the current interest in critical thinking is based on important conceptual, epistemological, and procedural confusions. It suggests that the attempt to identify a successful critical thinking construct mirrors the search for miracle tonics often peddled by snake oil salesmen as a medicinal cure-all. It goes to suggest that rather than attempting to rehabilitate the critical thinking discourse in some new fashion, educators and researchers simply abandon the discourse in its entirely to avoid the various fallacious assumptions it embodies. To best serve the interests of students, the paper recommends placing emphasis on more traditional concepts such as knowledge and subject understanding. The paper focuses on critical thinking and skill transfer; direct reference theory and critical thinking; Cartesian dualism, category mistakes, and critical thinking; and heuristic strategies and critical thinking. (Contains 12 references.) (Author/SM)

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Critical Thinking as Miracle Tonic: Selling Snake Oil in Education

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Abstract

This paper proposes that the current infatuation surrounding critical thinking is based on important conceptual, epistemological and procedural confusions. The attempt to identify a successful critical thinking construct mirrors the search for miracle tonics often peddled by snake oil salesmen as a medicinal cure-all. Rather than attempting to rehabilitate the critical thinking discourse is some new fashion, however, the author suggests simply abandoning the discourse in its entirety to avoid the various fallacious assumptions it embodies. To best serve the interests of students, the pedagogical emphasis must be placed on more traditional concepts such as knowledge and subject understanding.

Introduction

Those who traveled throughout North American selling snake oil during the 1800s were not actual doctors, but they attracted many willing customers by promising miracle cures for a range of serious medical problems. After the trail dust was wiped from the walls of their wagons, these entrepreneurs would hoist a sign reading something like "Dr. Brown's Wondrous Nerve Tonic" and in smaller letters beneath, "cures the sick and invigorates the healthy". Although snake oil salesman had to make a few elaborations on the truth to accomplish their task, many reports indicate those sampling the tonic often reported a significant improvement in their general state of health. In education, critical thinking is similarly touted as having the same ubiquitous curative effects as Dr. Brown's nerve tonic. The major difference of course is that whereas the latter's curative sought simplistic solutions to chronic health problems, critical thinking promises quick fixes to pedagogical concerns.

Mountains of scholarship highlight the perceived importance of critical thinking, suggest how the so-called "skill" can be developed and, in the more sophisticated discussions on the topic, the perceived epistemic and dispositional requirements of critical thinking are identified. The teaching and discussion of critical thinking has become nothing less than a growth industry in education. In this paper, I raise a number of portentous concerns with the academic activity surrounding critical thinking. I suggest that fallacious Cartesian metaphysics, from which the popular notion of skill transfer emerges, are so deeply embedded within presuppositions on critical thinking that draconian measures are required to ameliorate the problem. In effect, our infatuation with critical thinking reflects little more than the same placebo effect witnessed in those sampling the wondrous nerve tonic peddled by Dr. Brown. Current academic discussions on critical thinking are so conceptually, logically and epistemically defective that our collective integrity as educators is best served by abandoning the critical thinking discourse in its entirety.

Critical Thinking and Skill Transfer

The primary appeal of the popular meta-cognitive approach to critical thinking involves the conviction that it is a generic transferable skill widely applicable, not unlike

snake oil, to a range of contexts and conditions. Once the proper method of critical thinking has been mastered by students, or so the prevailing reasoning submits, then it simply becomes a matter of targeting various subjects and setting the skill in motion. Within a labor market milieu where employment stability is undermined by global shifts in capital, corporate relocation and downsizing, and technological change, this presupposed transferability of critical thinking solicits widespread appeal.

Within educational discourse, the term *transfer* typically refers to situations where something learned previously advances present learning or to circumstances where the technique employed to resolve a previous problem influences how a present problem is addressed. Woolfolk (1998) distinguishes between two types of skill transfer in education. *Low-road transfer* involves the spontaneous and automatic transfer of highly practiced skills in a manner not requiring significant reflection or further knowledge acquisition. The method of perfecting low-road transfer is simply practicing the particular skill or set of mechanical operations in question. Examples of low-road transfer include operating different but technically similar vehicles or the use of technology where the basic knowledge, understanding and mechanical procedures learned in one context are generally applicable in others. The knowledge and procedures required to operate a photocopier, for example, are generally transferable between contexts assuming the technology in question shares similar mechanical characteristics.

High-road transfer, on the other hand, involves consciously applying abstract knowledge, procedures or heuristics learned in one situation to some novel situation. Woolfolk argues, for example, that the key to high road transfer is identifying principles and strategies that apply to many different circumstances or can be successfully employed within a variety of contexts:

> The key to high-road transfer is mindful abstraction, or the deliberate identification of a principle, main idea, strategy, or procedure that is not tied to one specific problem or situation but could apply to many. Such an abstraction becomes part of your metacognitive knowledge, available to guide future learning and problem-solving. (p. 320)

The assumption that such "mindful abstraction" can be successfully performed reifies the conviction that high road transfer occurs and so-called cognitive skills such as critical thinking can be reduced to simple heuristic strategies and easily transferred between different contexts.

The idea of low-road transfer appears relatively unproblematic and something most of us execute with very little fanfare or even conscious reflection. The knowledge, understanding and mechanical procedures required to master various applied technologies, business equipment and operate similar but different machinery are indeed frequently transferable. Transfer occurs in these areas, however, because the accompanying change of context is primarily one of location rather than one of changing epistemic demands. In other words, operating a similarly designed photocopier in two different offices requires no significant new knowledge about photocopying techniques or related mechanical procedures. The efficacy of high-road transfer, however, especially as it relates to critical thinking, is far more in question.

An unquestioning commitment to highroad transfer is relatively common among educational psychologists. Perkins and Saloman (1989) maintain, for example, that "students often fail to apply knowledge and skills learned in one context to other situations. With well-designed instruction, we can increase the likelihood that they will" (p.22). The two researchers advocate teaching critical thinking for transfer by encouraging students to practice the skill in a variety of different contexts. In an attempt to confirm their view that critical thinking is transferable, Perkins and Saloman employ the following faulty analogy:

> Facing a move across town and concerned with economy, you rent a small truck to transport your worldly possessions. You have never driven a truck before and wonder whether you can manage it. Driving the truck is an experience unfamiliar, yet familiar. This everyday experience is a story of transfer – something learned in one context has helped in another. (p. 22)

Although the analogy may afford an excellent example of low-road transfer, it is highly problematic when associated with critical thinking. First, the example provided is

primarily a mechanical skill (driving) where although the context has indeed changed the basic knowledge and procedural operations remain essentially the same. Transfer would be far less likely between the two vehicles if the truck involved was a semi-tractor trailer with an eighteen speed gearbox and a pneumatic braking system since the comparative epistemic requirements are significantly altered.

The impact of changing epistemic requirements on critical thinking is easily demonstrated by exploring particular cases. The individual capacity to resolve a technical crisis at a nuclear powered generating station, for example, reveals no unique knowledge, ability or special insight that would allow the same person to modify surgical objectives after discovering an underlying pathology during neurosurgery. A skilled airline pilot who successfully confronts instrument failure by employing alternative guidance techniques may be unable to substitute a missing minor ingredient when baking bread. Successful problem-solving *vis-à-vis* critical thinking quite clearly requires rather precise knowledge about procedures, policies, processes and consequences specific to the issue in question.

Direct Reference Theory and Critical Thinking

The direct reference theory, owing its genesis at least in part to Platonic metaphysics and ontology, holds that every word is a kind of linguistic label that corresponds to some entity, an erroneous understanding of language often leading to profound ontological confusion. The direct reference theory of language creates what Quine (1964) describes as an overpopulated universe by affording ontological status to non-referential concepts. Much of the academic discussion surrounding critical thinking and other cognitive competencies reflects reasoning errors that emerge from a persistent reluctance within education to relinquish the semantic comfort furnished by direct reference theory.

According to the direct reference theory a word corresponds to an object, and nothing mediates between the word and its referent. Dummett (1993) explains the theory's basic axiom: "The thesis of direct reference is namely that the sole linguistic feature of a proper name, strictly so-called, consists in its reference" (p. 40). The direct reference theory holds that words are symbols and these symbols denote an ontological

entity providing the associated word with its meaning. Proper names such as Jones, for example, are meaningful by virtue of the fact they denote the object or individual the word or expression designates. When the direct reference theory is restricted to explaining how proper names denote specific objects or providing ostensive definitions it is reasonably successful. The theory begets grievous ontological difficulties, however, when employed to explain the meaning of words and expressions without a referent.

There is a general assumption among educators, and others as well, to assume that because some idiom exists, that is, imagination, critical or creative thinking, there must also exist a corresponding identifiable mental process to which the term refers. Indeed, arguments continue to rage over determining the nature of imagination, critical and creative thinking as if these concepts actually applied to some referential quality or objective standard of thought. Assessment practices abound attempting to measure creative and critical thinking in a context independent fashion, a pattern supporting the view many educators cling dogmatically to the view that these concepts actually denote identifiable mental processes (Bailin, 1994).

Seeking to alleviate the ontological and practical confusion generated by direct reference, Ryle (1953) stresses the non-referential quality of mental process concepts. He argues that the actual meaning of these terms is revealed by examining their use in ordinary language, a theme Wittgenstein (1967) vigorously pursues in Philosophical Investigations. Wittgenstein draws a crucial distinction between what he terms an ostensive definition, that is, a proper name attached to an object which can be described by pointing to it, and the kind of semantic connection between words and referents "when language goes on a holiday" (p. 19e). He submits that the historical prioritising of direct reference as the key determinant of meaning generates a certain kind of metaphysical blunder pervasive throughout Western thought. Concepts describing so-called mental processes such as critical thinking are identified by Wittgenstein as one area where this type of confusion commonly occurs.

Whereas Plato believed words were the names of things that exist unchanging and eternally, Wittgenstein suggests that a word's meaning is more correctly understood by examining its use in ordinary language. To employ one of his more famous analogies, words are like pieces in the game of chess since they are rule governed with their

meaning determined by the context in which they are spoken. Wittgenstein argues that the meaning of many idioms cannot be circumscribed by a corresponding referent because a word's semantic boundary is often imprecise. Many individual words have numerous applications and within varying contexts they mean many different things. If on one occasion I declare, "This student doesn't understand me", it might indicate the student misunderstands my character or motives, while on another he or she may be unable to understand my analysis of Wittgenstein's philosophy. Hence, the meaning of 'understand' is contextually dependent on the word's usage within the particular language game in which it is employed. The contextual semantic characteristics of mental process concepts, then, suggests that any attempt to identify fixed characteristics of critical thinking, or any other mental process concept, is necessarily doomed to failure.

Cartesian Dualism, Category Mistakes and Critical Thinking

A category mistake, most simply described, is the error committed when a concept, for whatever reason, is placed in the improper category. When classifying colours, for example, it is logically incorrect to place the concept of hot in the same category with red, blue, violet and green. Many category mistakes reflect more than simple errors in concept taxonomy, however, instead generating fundamental misunderstandings about the qualities or characteristics of the concepts themselves. As Ryle (1953) points out, placing the activity of exhibiting team spirit in same category with the baseball skills of pitching batting and catching is to commit a category mistake. Team spirit is not a skill like batting that can be improved by practicing a particular set of physical operations. Rather, the concept of team spirit describes the collective emotional disposition of the players on a given team. The category mistakes committed by the discourse on critical thinking is directly traceable to the improper logical mapping of linguistic concepts identified by Ryle.

Although there are other philosophers he could have singled out - the name of Plato springs immediately to mind - Ryle targets Descartes and the latter's theory of psycho-physical dualism as the primary source of mental process category mistakes:

> Now the dogma of the Ghost in the Machine does just this.
> It maintains that there exists both minds and bodies; that

> there occur physical processes and mental processes . . . But I am saying that the phrase 'there occur mental processes' does not mean the same sort of thing as 'there occur physical processes' and therefore, that it makes no sense to conjoin or disjoin the two. (p.22)

The category mistake committed by many critical thinking proponents, then, begins with accepting the Cartesian description of a person as comprised of mind and body, and assimilating statements about mental processes to the same logical category as statements describing physical processes. Since linguistic concepts are used to describe a wide range of physical activities such as photocopying, walking, running and driving, psycho-physical dualism implies the need for a counterpart set of idioms describing mental activities such as imagining, understanding, critical thinking, creative thinking and problem-solving. The idioms describing mental activities, however, are logically distinct from those describing physical activities since they must be grammatically situated in the form *thinking* or *imagining x* when employed in language. Hence, it is a category mistake to conflate the two different types of concepts and assume they share particular qualities or characteristics.

In fact, many context free applications of critical thinking as described in meta-cognitive strategies are predicated on fallacious faculty psychology presuppositions that do presuppose mental capacities can be improved analogous to physical ones. The connection to the category mistakes emerging from Cartesian dualism identified above is clear:

> Whatever they might say if pressed on the point, educators talk as if, and they proceed as if, critical thinking were a skill like dribbling a ball, albeit more complex, and could be trained or developed in the same sort of way – namely, by practice in the activity itself. Certainly, if something other than the idea that the mind and emotions can be exercised, and capacities developed, analogously to the exercise and development of physical skills, is presupposed by typical curriculum injunctions to develop emotional,

> interpersonal and intellectual skills, it remains unclear what that something is. (Barrow, 1987, p. 191)

A meta-cognitive approach designed to foster critical thinking skills fuels the concern that faculty psychology tenets remain a contemporary pedagogical force. In stage one of a critical thinking method proposed by Wilen and Phillips (1995), for example, teachers are encouraged to "introduce the skill, show examples and non-examples, and use exercises to practice the skill" (p. 136).

Offering a critique of critical thinking based on the logical structure of language, McPeck (1981) draws an analogy between *speed* and *reasoning ability*, the latter term sometimes employed as a corollary concept for critical thinking. The logical mapping error in applying reasoning ability and critical thinking in a context free fashion is manifestly illustrated by McPeck's analogy. Clearly, it makes no logical sense to practice improving speed unless there is some provided context for such repetition: "If, just out of the blue, someone offered to improve our *speed*, the first thing we would properly ask is 'at what'?" (p. 2). To improve one's speed at washing dishes requires a distinctly different set of operations and knowledge from enhancing one's speed at falling asleep. McPeck correctly suggests that believing critical thinking can be generically enhanced is as logically and practically ill-conceived as believing that speed can be improved without identifying the targeted activity. Critical thinking, or thinking in general, is logically connected to particular objects and subjects of thought. On McPeck's account, since these subjects differ enormously in scope, there is no one general skill, no pedagogical cure-all or tonic, that can be applied generically to all situations.

Heuristic Strategies and Critical Thinking

Some education programs advocating a generic model of critical thinking include a problem-solving strategy or procedural steps for general application (Ministry of Education, 2001). Referred to as the *designing model*, one particular approach provides a series of heuristics designed to help resolve any given problem: 1) identify problem; 2) determine parameters; 3) conduct research; 4) generate solutions; 5) choose best solution; 6) implement solution; 7) test and evaluate; 8) redesign and refine. Although these

strategies may afford a general framework for abstract problem-solving, they are, in the final analysis, extremely limited in their subject specific effectiveness.

Wittgenstein (1967) highlights the limitations of heuristic problem-solving strategies by arguing that formal systems are virtually useless in the absence of subject knowledge and contextual understanding. The simple procedural instructions of *wash, rinse* and *repeat* illustrate Wittgenstein's point. The questions of what is being washed, how it should be washed and with what are inescapable in affording the provided steps with any substantive meaning. Illustrating the importance of understanding context in applying heuristic systems, ordering the injunction to repeat the steps at the end of the procedure demands *ad infinitum* repetition of the provided instructions. Only by understanding the instructional context and possessing adequate subject knowledge, then, can formal systems, including heuristic models of critical thinking and problem-solving, be effectively applied.

McPeck (1981) suggests that the ineffectiveness of the heuristic approach to critical thinking mirrors the problem confronted by computer programmers trying to design artificial intelligence software: "In designing computer programs to solve ill-structured or open-ended problems, one strategy is to employ certain heuristic devices, or rules of thumb, which will suggest plausible solutions" (p. 10) It is axiomatic in designing software to address this difficulty that the more general a given heuristic, the less useful it becomes for any specific problem-solving application. Teaching students to entertain alternative points of view on whether light travels as particles or waves, for example, is of minimal value if they lack knowledge about the opposing theories to understand and evaluate the attending complexities of the alternative viewpoints.

Many of the other supposedly generic injunctions contained in critical thinking strategies also require sensitivity to context and subject specific knowledge. Bailin, Case, Coombs and Daniels (1999) explain this important epistemological point:

> The kinds of acts, such as predicting and interpreting, which are put forth as generic skills will, in fact, vary greatly depending on context, and this difference is connected with the different kinds of knowledge and understanding necessary for successful completion of the

> particular task. Interpreting a graph is a very different sort of activity from interpreting a play. (p. 271)

Interpreting a graph requires understanding the relationship between the various plotted entities based on certain geometric conventions. Interpreting a play, on the other hand, involves considering possible themes or meanings based on textual evidence. Simple procedural instructions such as interpreting and predicting, then, must be understood within the specific context in which they are employed.

Abandoning the Critical Thinking Discourse: Some Concluding Remarks

As previously suggested, my interest in this paper is not to rehabilitate some notion of critical thinking to overcome the serious problems highlighted herein. My singular aim has been to identify the profound conceptual, logical and procedural errors encouraging its promotion as a miracle tonic to cure virtually all pedagogical ills. Since it is impossible to clarify or articulate that which is non-clarifiable we should simply abandon talk of critical thinking altogether. For as long as we discuss critical thinking as a generic transferable skill, an idiom identifying some particular mental process or a series of simple heuristic procedural steps, we are hindering more than helping student learning. We must simply appreciate that the arduous climb leading from the darkness of the cave to the enlightenment borne through knowledge and understanding is a laborious lifelong journey with no weekend workshop fixes or miraculous tonic cures. In education, it's time to put the snake oil salesmen out of business.

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